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ABSTRACT OF THE DISCLOSURE

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A heavy-duty flame propagation engine has control systems and exhaust
3 aftertreatment systems adapted to provide ultra-low emissions relative to Diesel
4 engines while achieving comparable fuel consumption at reduced emission levels.

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The control systems include exhaust gas circulation, variable valve actuation, cylinder
6 deactivation, pilot fuel injection, high energy ignition systems and combinations
7 thereof to provide substantially stoichiometric combustion conditions over an entire
8 load range of the engine. In one embodiment, the engine has direct in-cylinder fuel
9 injection, is adapted for lean air-fuel mixture operation, and includes an oxidation
10 catalyst and a lean NO_x adsorber.